

## CLAIMS

Therefore, having thus described the invention, at least the following is claimed:

- 1        1. A system for transmitting and receiving information, said system  
2 comprising:
  - 3              a first layer transceiver device;
  - 4              a plurality of second layer transceiver devices; and
  - 5              an interface connecting said first layer transceiver device and said plurality of
  - 6              second layer transceiver devices,
    - 7                  wherein said first layer transceiver device and said plurality of second layer
    - 8                  transceiver devices transmit and receive said information across said interface,
    - 9                  wherein said information comprises data and a time division multiplexed (TDM)
    - 10               signal,
    - 11               wherein said TDM signal indicates the availability of one of said second layer
    - 12               transceiver devices.
  
- 1        2. The system of claim 1, wherein said TDM signal comprises a transmit  
2           available indicator of whether one of said plurality of second layer transceiver devices can  
3           receive said information from first layer transceiver

1           3. The system of claim 1, wherein said TDM signal comprises a receive  
2 available indicator of whether one of said plurality of second layer transceiver devices can  
3 transmit said information to first layer transceiver.

1           4. The system of claim 1, wherein a first second layer transceiver device of  
2 said plurality of second layer transceiver devices is granted access to write said  
3 availability to said TDM signal, said access based upon a plurality of conditions.

1           5. The system of claim 4, wherein said plurality of conditions comprises a  
2 synchronization signal being detected as asserted on the edge of a reference clock and a  
3 certain amount of delay being expired.

1           6. The system of claim 5, wherein said certain amount of delay is a calculated  
2 amount of clock edges after assertion of said synchronization signal, said calculated  
3 amount equal to an address of said first second layer transceiver device minus one.

1           7. The system of claim 5, wherein said plurality of conditions comprises a  
2 speed access variable, said speed access variable allowing a high speed transceiver of said  
3 second layer transceiver device to write said availability multiple times during a  
4 synchronization period.

1           8.     The system of claim 1, wherein said TDM signal is transmitted and  
2     received in-band along with said data over a data stream.

1           9.     The system of claim 1, wherein said TDM signal is transmitted and  
2     received out-of-band from said data in a plurality of separate signals.

1           10.    A system for transmitting and receiving information, said system  
2     comprising:  
3         a first layer transceiver device;  
4         a plurality of second layer transceiver devices;  
5         an interface connecting said first layer transceiver device and said plurality of  
6     second layer transceiver devices,  
7         wherein said first layer transceiver device and said plurality of second layer  
8     transceiver devices transmit and receive said information across said interface;  
9         wherein said information comprises a plurality of data and a plurality of control  
10    signals to control the transmission and reception of said information over said interface;  
11    and  
12    a protocol data unit (PDU) for data transfer of said information,  
13    wherein said PDU comprises an address for one of said plurality of second layer  
14    transceiver devices.

1           11. The system of claim 10, wherein said address is the destination address of  
2 one of said plurality of second layer transceiver devices for which said information in said  
3 PDU is intended.

1           12. The system of claim 10, wherein said address is the source address of one  
2 of said plurality of second layer transceiver devices from which said information in said  
3 PDU originated.

1           13. The system of claim 10, wherein said PDU comprises a header portion, a  
2 user defined (UDF) portion, and a payload portion.

1           14. The system of claim 13, wherein said UDF portion comprises said address.

1           15. The system of claim 10, wherein said address can be of any length.

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1           16. A system for transmitting and receiving information, said system  
2 comprising:  
3           an ATM layer transceiver device;  
4           a plurality of physical layer transceiver devices; and  
5           an ATM to physical layer interface module connecting said ATM layer transceiver  
6 device and said plurality of physical layer transceiver devices,  
7           wherein said ATM layer transceiver device and said plurality of physical layer  
8 transceiver devices transmit and receive said information across said ATM to physical  
9 layer interface module,  
10          wherein said information comprises a plurality of data and a plurality of control  
11 signals to control the transmission and reception of said information over said ATM to  
12 physical layer interface module,  
13          wherein at least one of said plurality of control signals is a time division  
14 multiplexed (TDM) signal.

1           17. The system of claim 16, wherein said time division multiplexed signal  
2 indicates the cell availability of one of said physical layer transceiver devices.

1           18. The system of claim 16, wherein said time division multiplexed signal  
2 comprises a transmit cell available (TxClav) indicator of whether one of said plurality of  
3 physical layer transceiver devices can receive said information.

1           19. The system of claim 16, wherein said time division multiplexed signal  
2       comprises a receive cell available (RxClav) indicator of whether one of said plurality of  
3       physical layer transceiver devices can transmit said information.

1           20. The system of claim 16, wherein a first physical layer transceiver device of  
2       said plurality of physical layer transceiver devices is granted access to write said  
3       availability to said time division multiplexed signal, said access based upon a plurality of  
4       conditions.

1           21. The system of claim 20, wherein said plurality of conditions comprises a  
2       synchronization signal being detected as asserted on the edge of a reference clock and a  
3       certain amount of delay being expired.

1           22. The system of claim 21, wherein said certain amount of delay is a  
2       calculated amount of clock edges after assertion of said synchronization signal.

1           23. The system of claim 21, wherein said calculated amount is equal to an  
2       address of said first physical layer transceiver device minus one.

1           24. The system of claim 22, wherein said ATM to physical interface module  
2 comprises a ATM layer cell availability status device and a physical layer cell availability  
3 status device.

1           25. The system of claim 24, wherein said ATM layer cell availability status  
2 device communicates with said ATM Layer and said physical layer cell availability status  
3 device.

1           26. The system of claim 25, wherein said communication between said  
2 physical layer cell availability status device and said ATM layer cell availability status  
3 device comprises a plurality of interface control signals and interface data.

1           27. The system of claim 26, wherein a first of said plurality of interface  
2 control signals is said TDM signal.

1           28. The system of claim 27, wherein a second of said plurality of control  
2 signals is said synchronization signal and a third of said plurality of control signals is said  
3 reference clock.

1           29. The system of claim 28, wherein said interface data is a protocol data unit  
2 (PDU).

1           30.   The system of claim 29, wherein said PDU comprises a header portion, a  
2   user defined (UDF) portion, and a payload portion.

1           31.   The system of claim 30, wherein said UDF portion comprises an address  
2   of one of said plurality of physical layer devices

1           32.   A method for transmitting and receiving information, said method  
2   comprising steps of:

3           implementing a first layer transceiver device;  
4           implementing a plurality of second layer transceiver devices; and  
5           providing an interface connecting said first layer transceiver device and said  
6   plurality of second layer transceiver devices, wherein said first layer transceiver device  
7   and said plurality of second layer transceiver devices transmit and receive said  
8   information across said interface, wherein said information comprises data and a time  
9   division multiplexed (TDM) signal, wherein said TDM signal indicates the availability of  
10   one of said second layer transceiver devices.

1           33.   The method of claim 32, wherein said TDM signal comprises a transmit  
2   available indicator of whether one of said plurality of second layer transceiver devices can  
3   receive said information.

1           34. The method of claim 32, wherein said TDM signal comprises a receive  
2 available indicator of whether one of said plurality of second layer transceiver devices can  
3 transmit said information.

1           35. The method of claim 32, wherein a first second layer transceiver device of  
2 said plurality of second layer transceiver devices is granted access to write said  
3 availability to said TDM signal, said access based upon a plurality of conditions.

1           36. The method of claim 35, wherein said plurality of conditions comprises a  
2 synchronization signal being detected as asserted on the edge of a reference clock and a  
3 certain amount of delay being expired.

1           37. The method of claim 36, wherein said certain amount of delay is a  
2 calculated amount of clock edges after assertion of said synchronization signal, said  
3 calculated amount equal to an address of said first second layer transceiver device minus  
4 one.

1           38. The method of claim 36, wherein said of said plurality of conditions  
2 comprises a speed access variable, said speed access variable allowing a high speed  
3 transceiver of said second layer transceiver device to write said availability multiple times  
4 during a synchronization period.

1           39.     A method for transmitting and receiving information, said method  
2 comprising steps of:  
3                 implementing a first layer transceiver device;  
4                 implementing a plurality of second layer transceiver devices;  
5                 providing an interface connecting said first layer transceiver device and said  
6     plurality of second layer transceiver devices, wherein said first layer transceiver device  
7     and said plurality of second layer transceiver devices transmit and receive said  
8     information across said interface;  
9                 providing a plurality of control signals to control the transmission and reception of  
10    said information over said interface; and  
11                 implementing a protocol data unit (PDU) for data transfer of said information,  
12     wherein said PDU comprises an address for one of said plurality of second layer  
13     transceiver devices.

1           40.     The method of claim 39, wherein said address is the destination address of  
2     one of said plurality of second layer transceiver devices for which said information in said  
3     PDU is intended.

1           41.     The method of claim 39, wherein said address is the source address of one  
2     of said plurality of second layer transceiver devices from which said information in said  
3     PDU originated.

1           42. The method of claim 39, wherein said PDU comprises a header portion, a  
2 user defined (UDF) portion, and a payload portion.

1           43. The method of claim 42, wherein said UDF portion comprises said  
2 address.

1           44. The method of claim 39, wherein said address can be of any length.

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